



IEA Bioenergy
Technology Collaboration Programme

Task 42
Biorefining in a circular economy



Country Update Italy

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Italy, June 2022

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Technology Collaboration Programme

by **iea**


REPowerEU (pending a transposition legislation in Italy)

18 May 2022


ACCELERATING THE ROLLOUT OF RENEWABLES

SETTING A TARGET OF 10 MILLION TONNES OF DOMESTIC RENEWABLE HYDROGEN

A BIOMETHANE ACTION PLAN TO INCREASE PRODUCTION TO 35 BCM BY 2030



2030
Doubling the EU ambition for biomethane to produce 35 bcm per year by 2030, in particular from agricultural waste and residues.



A Hydrogen Accelerator to develop infrastructure, storage facilities and ports, and replace demand for Russian gas with additional 10 mt of imported renewable hydrogen from diverse sources and additional 5 mt of domestic renewable hydrogen.

ITALIA DOMANI, the National Recovery and Resilience Plan

The development of RES is part of the MISSION 2 of the National Recovery and Resilience Plan, ITALIA DOMANI

MISSION2: Green revolution and ecological transition

30 April 2021

A deep change to achieve Italy's green and ecological transition by promoting the circular economy, the development of renewable energy sources and more sustainable agriculture.

Total allocated to the Mission

€ 59.46 mld

31.05 %

of the total
value of the
NRRP

ITALIA DOMANI, the National Recovery and Resilience Plan



Create Hydrogen Valleys

to promote the production and use of hydrogen, prioritising abandoned industrial areas.

Redevelopment of brownfield sites for the production of hydrogen to be used for local transportation and industry

KEY DATES

by March 2023

Total investment cost

€ 500 million

Adjudication of hydrogen producing projects in abandoned industrial areas

Adjudication of (all of the) public contracts for projects related to hydrogen production in abandoned industrial areas

by June 2026

Completion of 10 projects

Complete at least 10 hydrogen producing projects in abandoned industrial areas with a capacity of at least 1-5 MW each

On April 29, the Italian Minister of Ecological Transition, Roberto Cingolani, signed the decree that makes 450 million euros available to finance projects aimed at developing the green hydrogen supply chain

ITALIA DOMANI, the National Recovery and Resilience Plan



Development of biomethane

to make the gas network more sustainable by increasing the power of reconverted biomethane

Developing the use of biomethane to better recover organic waste

KEY DATES

by December 2023

Production of at least 600 million cubic meters of biomethane

Develop biomethane production for at least 600 mcm of biomethane through plant conversion

by June 2026

Production of at least 2,3 billion cubic meters of biomethane

Reach biomethane production of at least 2.3 bmc of biomethane through plant conversion and plant efficiency

Total investment cost

€ 1.92 bn

BIOFUELS STRATEGY

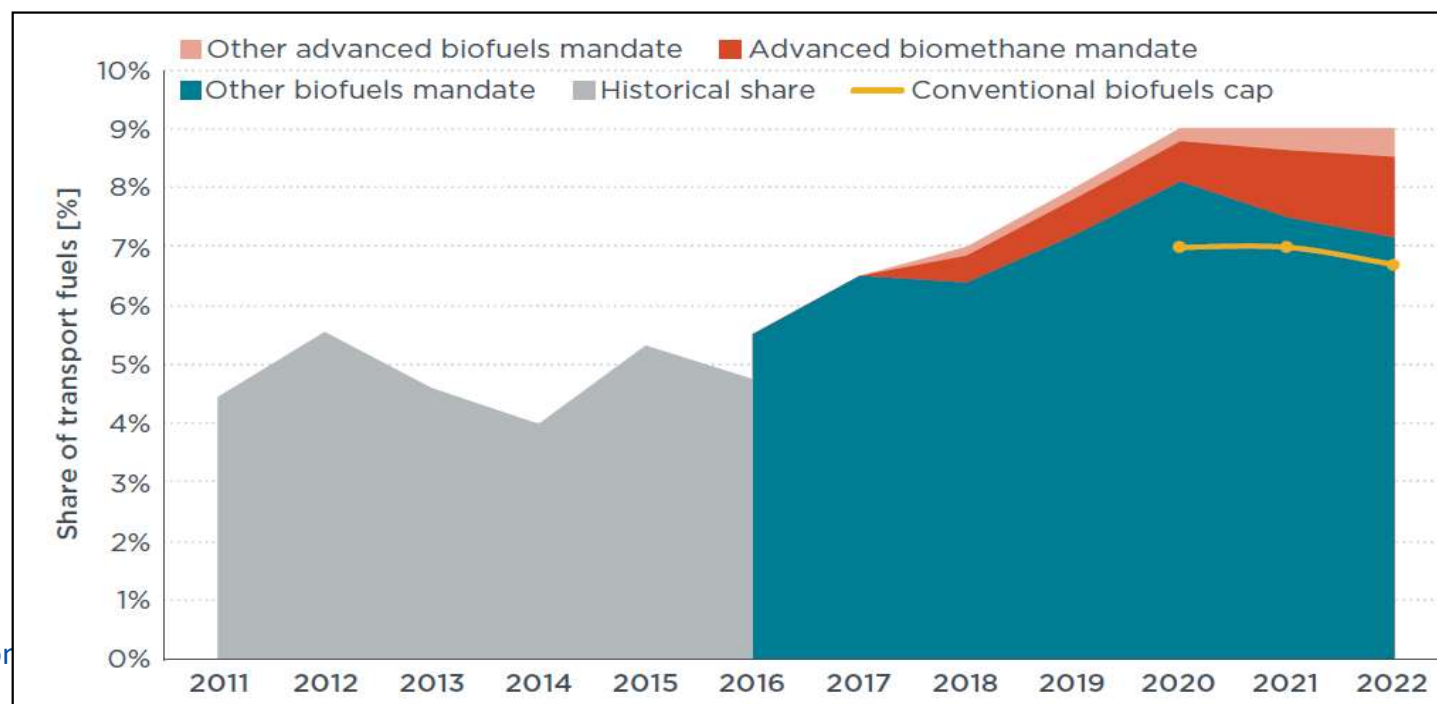
The Italian Government continues to support the penetration of advanced biofuels

On March 2, 2018, Italy amended the biofuel mandate to 9% by 2020 a specific mandate for advanced biofuels.

Obligation for advanced biofuels from 0.6% in 2018 to 1.85% in 2022.

The advanced biofuel target is further sub-divided:
75% advanced biomethane
25% other advanced biofuels

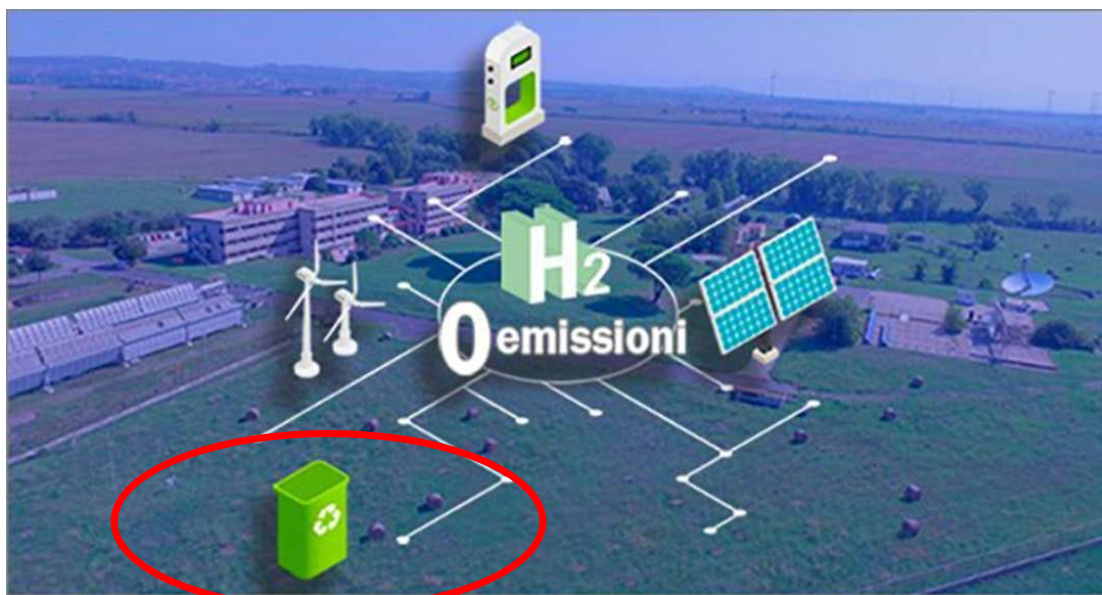
Historical share of biofuels in transportation fuels in Italy through 2016 and the 2022 biofuels target, including a sub-target for advanced biofuels and advanced biomethane



PROJECTS OF SIGNIFICANT NATIONAL INTEREST

HYDROGEN

ENEA CASACCIA HYDROGEN VALLEY



RESIDUAL BIOMASS

On 23 March, the Italian Ministry of Ecological Transition, Roberto Cingolani, signed an agreement with ENEA for research and development activities on hydrogen, which will be financed with the resources of the National Recovery and Resilience Plan (NRPP).

An investment of **14 million euros** to create **the first Italian technology incubator**, in collaboration with universities, research institutes, associations and companies. According to ENEA, the research center will also allow the experimentation of new technologies for the production of hydrogen, for example, through the **use of waste** and the **use of renewable medium-high temperature heat produced by concentrating solar plants**. The construction of a local hydrogen pipeline dedicated to the transport of pure hydrogen under pressure and a refueling station for vehicles in use within the research center is also planned.

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

HYDROGEN



NEXTCHEM: WASTE TO HYDROGEN and WASTE TO METHANOL

NextChem (Marie Tecnimont Group) is running an important project together with **ENI**, for the implementation of two new plants:
“Waste to Hydrogen” plant in Porto Marghera (Venice, Italy)
“Waste to Methanol” plant in Livorno (Italy)

The plants will be based on NextChem’s technology for the chemical recycling of plastic waste (plasmix) and dry waste



PROJECTS OF SIGNIFICANT NATIONAL INTEREST

HYDROGEN

EDISON and ANSALDO ENERGIA with ENI to produce hydrogen

On February 22, ENI signed **an agreement with Edison and Ansaldo Energia** to experiment with the production of hydrogen for use **in place of methane** in **Edison's new power station in Porto Maghera**. The hydrogen used will be either "green", which means **hydrogen derived from water by electrolysis using energy from renewable sources**, or "blue", in other words produced from methane, but involving **capture of the CO₂ emitted as part of the process**.



PROJECTS OF SIGNIFICANT NATIONAL INTEREST

HYDROGEN

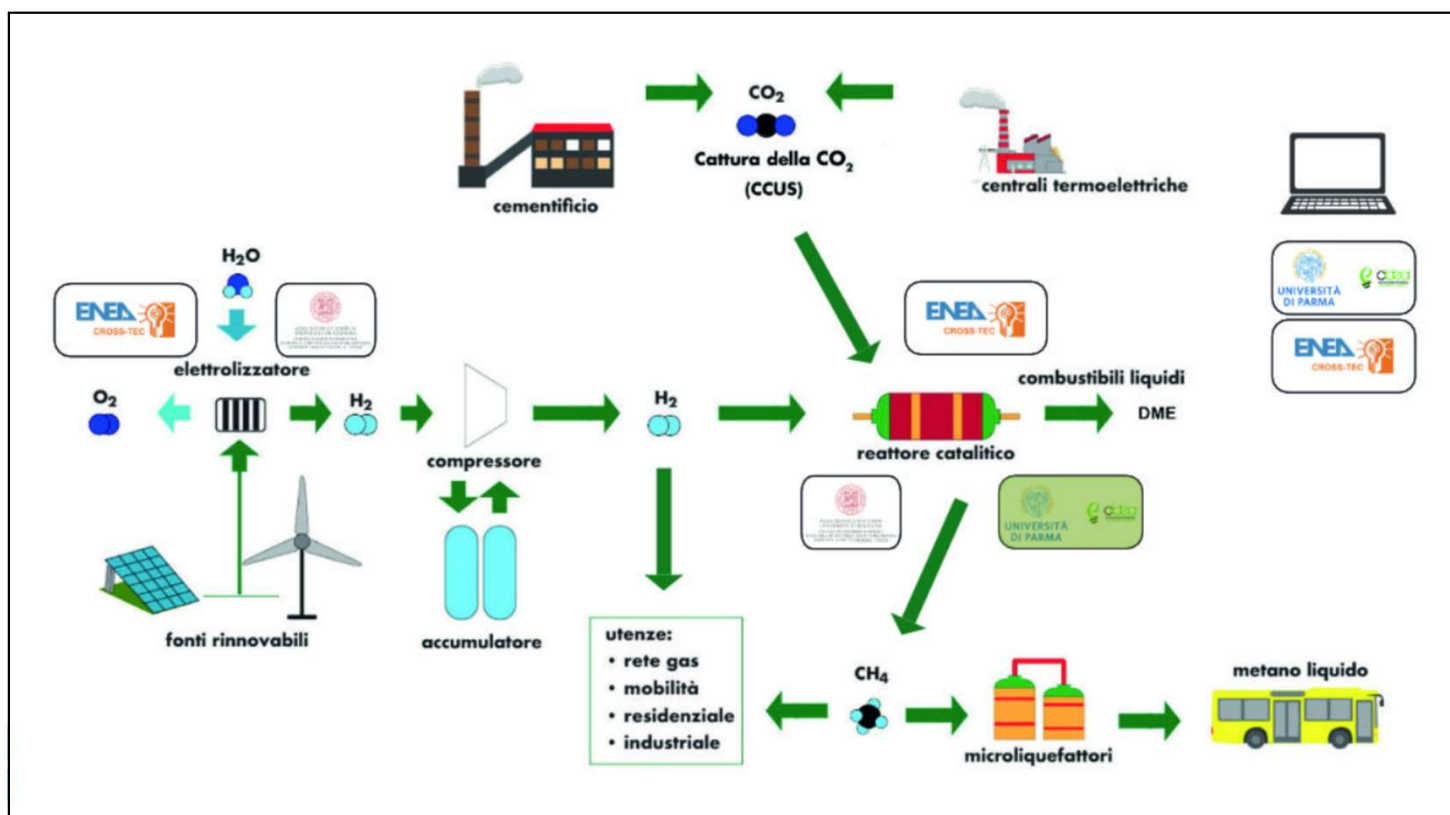
E-CO₂ PROJECT



Regione Emilia-Romagna



Innovative fuels produced at zero-emissions with green hydrogen and CO₂



The project is divided into **4 phases**:

1. Evaluation of **CO₂ capture** technologies in the industrial sector
2. Systems for the production and **storage of hydrogen** from non-programmable renewable source
3. Application of **synthetic fuels** for corporate energy efficiency, construction and testing of a prototype for the production of synthetic fuels
4. Dynamic models of plants for the **production of synthetic fuels from CO₂** and electricity renewable.



PROJECTS OF SIGNIFICANT NATIONAL INTEREST

BIOREFINERY AND GREEN CHEMISTRY



CELLULOSIC BIOETHANOL PRODUCTION IN CRESCENTINO

16 February 2022



CRESCENTINO (VERCELLI, ITALY)

VERSALIS RESTART THE PRODUCTION OF BIOETHANOL FROM LIGNOCELLULOSIC BIOMASS IN CRESCENTINO

INSTALLED CAPACITY **40 000 TONS/YEAR**

The plant is capable of processing **200 000 tonnes of biomass per year**, with a maximum production capacity of approximately **25 000 tonnes of bioethanol per year**. Following an initial test production run in recent weeks, the plant is now working at a progressive speed in order to fine-tune processes.

Since July 2020, Crescentino has also been producing **Invix® hand and surface disinfectant**, a “medical device” made **using bio-based ethanol as active ingredient**.

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

BIOREFINERY AND GREEN CHEMISTRY



HVO-TYPE BIODIESEL PRODUCTION IN PORTO MARGHERA AND GELA



PORTO MARGHERA (VENICE, ITALY)

THE FIRST CONVENTIONAL REFINERY IN THE WORLD TO GO "BIO"

START-UP YEAR 2014

INSTALLED CAPACITY 170 000 TONS/YEAR (EXTENSION 1 000 000 TONS/YEAR by 2023)

Ecofining™ technology: turning organic waste into biofuel



GELA (CALTANISSETTA, ITALY)

EUROPE'S MOST INNOVATIVE BIOREFINERY

START-UP YEAR 2019

INSTALLED CAPACITY 600 000 TONS/YEAR

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

BIOREFINERY AND GREEN CHEMISTRY



WASTE TO FUEL: BIOFUEL FROM FOOD WASTE, THE PILOT PLANT IN GELA



Waste to Fuel can treat **sewage sludge, plant waste, waste from the agri-food industry** and large-scale distribution



The Waste to Fuel technology produces biofuels from the Organic Fraction of Municipal Solid Waste (OFMSW), made up of leftover kitchen waste. It produces a **bio-oil that can be used for sea transport**, due to its **low sulphur content**, or refined into **high performance advanced biofuels**.

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

BIOREFINERY AND GREEN CHEMISTRY



VERSALIS INCREASE ITS STAKE IN NOVAMONT FROM 25% TO 35%

29 March 2022



Versalis and Novamont strengthen their partnership in green chemistry, a key sector for the ecological transition.

Versalis increase its stake in Novamont from 25% to 35%. At the end of this reorganization, the ownership structure of Novamont is configured as follows: Mater-Bi (held by private investors) 65%, Versalis 35%.

The two companies **reconfirmed their commitment to Matrìca** - the joint venture established in 2011 between Versalis and Novamont in **Porto Torres** and specialized in the production of bioproducts from renewable sources - **with the aim of enhancing technologies and production assets for the full development of products in reference markets, focusing on their development and growth.**

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

NEW VALUE CHAINS FROM URBAN WASTES



CIRCULAR BIOCARBON PROJECT

2022 – Starting to build a new biorefinery in Lombardia

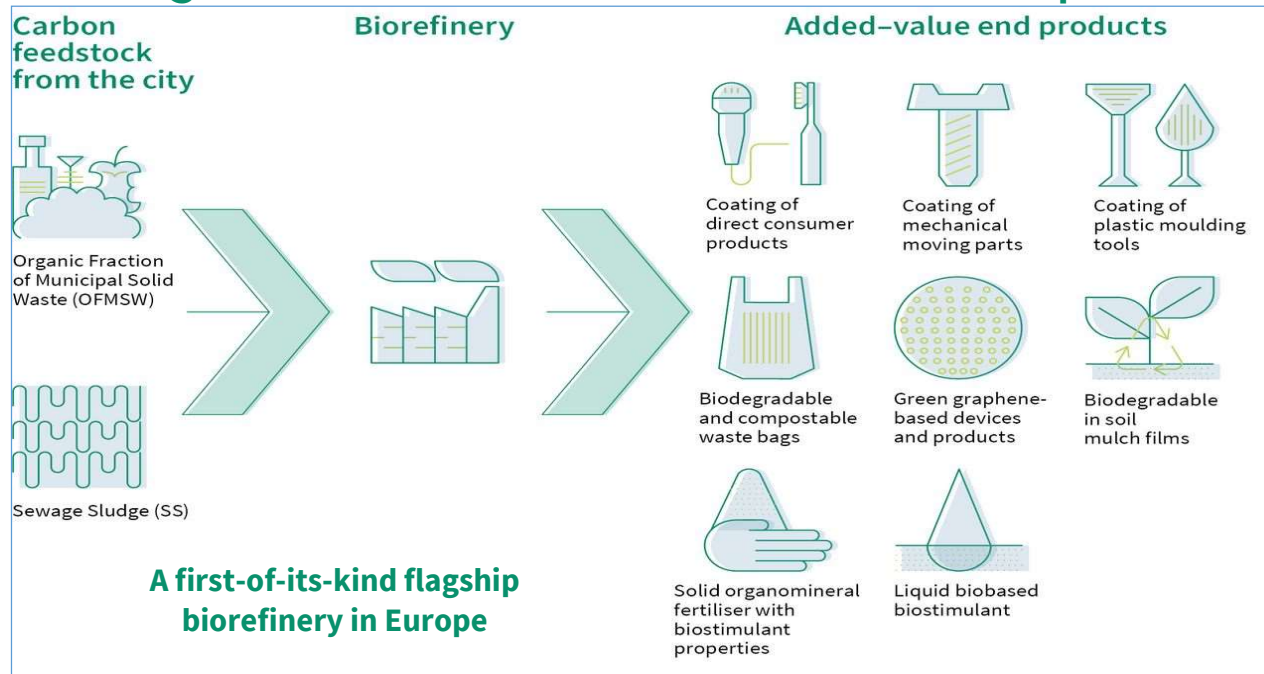


Sesto San Giovanni, Italy



Zaragoza, Spain

Turning urban waste streams into value-added products



MAIN ITALIAN PARTNERS:



At the end of the project, **a commercial-scale biorefinery will be in full operation**, treating wet waste and serving **5 municipalities** in Lombardia: Sesto San Giovanni, Pioltello, Cormano, Segrate, Cologno Monzese.

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

NEW VALUE CHAINS FROM URBAN WASTES



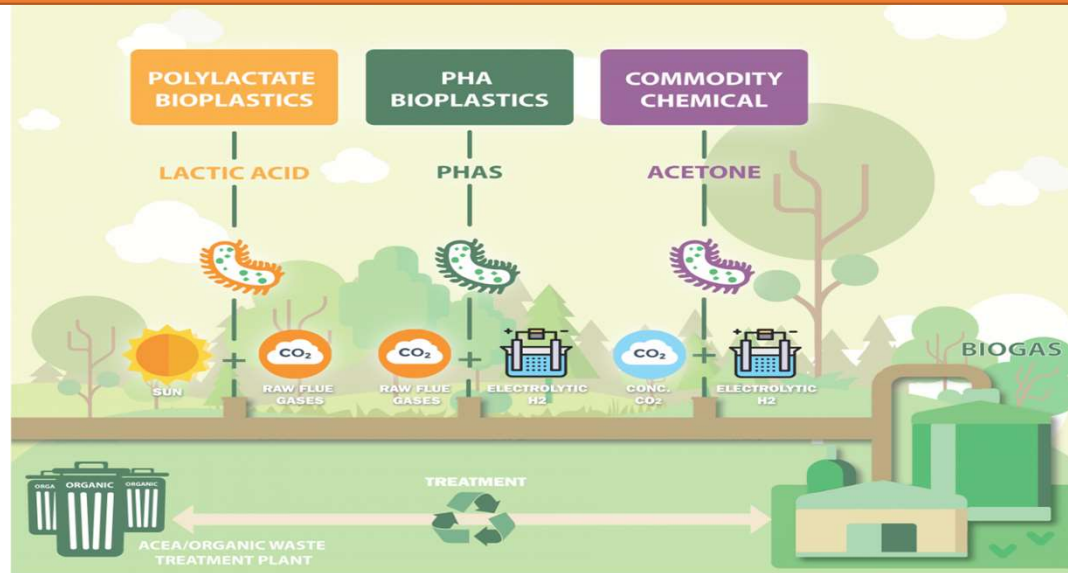
ENGICOIN PROJECT

Engineered microbial factories for CO₂ exploitation in an integrated waste treatment Platform in Piemonte



Pinerolo, Italy

MAIN ITALIAN PARTNERS:



TRL 5 bioreactors validation in a real biorefinery environment

From municipal waste to



LACTIC ACID



PHA



ACETONE



Bio-based products

www.ieabioenergy.com

<http://task42.ieabioenergy.com>



Task 42

Biorefining in a circular economy

PROJECTS OF SIGNIFICANT NATIONAL INTEREST

NEW VALUE CHAINS FROM URBAN WASTES



B-PLAS (SPIN-off) PROJECT

From Waste to Value: producing PHA from sludges



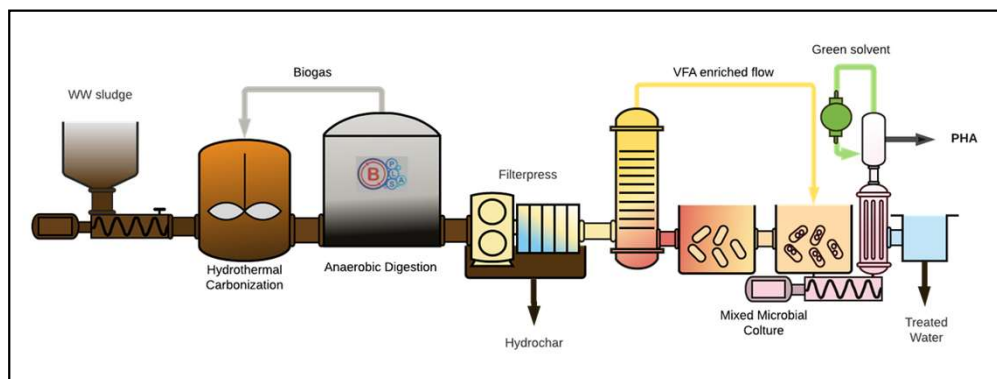
B-PLAS Pilot Plant at University of Bologna, Italy

NUMBERS OF THE PLANT:

Total area: 100m²
 Sector of application: agro-industry
 Nominal capacity: 2,7 m³/g nominal of inlet sludge
Project status: TRL 8
 Nominal production: 2-4 kg/day of PHA
 Cutgoing sludge: 0,2 m³/g
 Operation: H24



MAIN ITALIAN PARTNERS:



B-PLAS won PNI 2019 (National Award for Innovation)

www.ieabioenergy.com
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